

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 26 JULY 2005 (26.07.2005)

Applicant's or agent's file reference  
PP05-0104

FOR FURTHER ACTION

See paragraph 2 below

International application No.  
**PCT/KR2005/001120**

International filing date (day/month/year)  
**19 APRIL 2005 (19.04.2005)**

Priority date(day/month/year)  
22 APRIL 2004 (22.04.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 B01J 29/04

Applicant

LG CHEM, LTD. et al

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application


## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.  
For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR

 Korean Intellectual Property Office  
920 Dunsan-dong, Seo-gu, Daejeon  
302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Date of completion of this opinion

25 JULY 2005 (25.07.2005)

Authorized officer

LEE, SI GEUN

Telephone No.82-42-481-8151



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/001120

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper  
☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in electronic form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

10/587978

IAP11 Rec'd PCT/PTO 03 AUG 2006

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/001120

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1 - 14	YES
	Claims		NO
Inventive step (IS)	Claims	8 - 14	YES
	Claims	1 - 7	NO
Industrial applicability (IA)	Claims	1 - 14	YES
	Claims		NO

**2. Citations and explanations :**

The following documents have been considered for the purpose of this opinion:

D1 : EP 1333920 A2

D2 : EP 1200537 A2

D3 : EP 1363725 A2

The present invention relates to a hydrocarbon cracking catalyst in which zeolite is fixed in the pores of metal oxide, and a method for preparing the same. The method of the invention comprises the steps of a) vacuumizing a container including metal oxide; b) adding zeolite powder in water and stirring it to obtain a slurry solution; c) spraying the slurry solution of step b) into the vacuous container to penetrate it into the pores of the metal oxide support ; and d) drying and calcining it.

D1 relates to Zeolite microsphere FCC catalysts having a novel morphology comprising a macroporous matrix and crystallized zeolite freely coating the walls of the pores of the matrix. D2 relates to a method of converting C4 -C7 olefins in hydrocarbon feed to ethylene and propylene by using a catalyst including zeolites, alumina, silica and kaoline. D3 relates to a cracking catalyst composition comprising a physical mixture of 10-90 weight% of a cracking catalyst A and 90-10 weight% of a cracking catalyst B, whereby catalyst A is a zeolite-containing cracking catalyst, and catalyst B is a catalyst having a higher average pore volume in the pore diameter range of 20-200 Å than catalyst A in the same pore diameter range.

**I. Novelty and Inventive Step**

Though the hydrocarbon cracking catalyst in which zeolite is fixed in the pores of metal oxide of claims 1-7 is novel since the cited documents do not disclose the same, it can be easily invented from the cracking catalyst including metal oxide such as silica, alumina, etc. and zeolite without any particular technical difficulty, so that claims 1-7 are not inventive. However, the method of preparing catalyst by spraying the zeolite slurry solution into the vacuous container to penetrate it into the pores of the metal oxide of claims 8-14 is novel and cannot be easily invented by a person skilled in the art.

**II. Industrial Applicability**

There is no reason for forming a negative opinion about the industrial applicability of this invention. Consequently, claims 1 - 14 appear to meet the requirement of PCT Article 33(4).

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/001120

**Box No. VI Certain documents cited**

**1. Certain published documents (Rule 43bis.1 and 70.10)**

<u>Application No. Patent No.</u>	<u>Publication date (day/month/year)</u>	<u>Filing date (day/month/year)</u>	<u>Priority date (valid claim) (day/month/year)</u>
US 85538604	30.12.2004	28.05.2004	30.05.2003
US 2004-266608 A1			

**2. Non-written disclosures (Rule 43bis.1 and 70.9)**

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day/month/year)</u>	<u>Date of written disclosure referring to non-written disclosure (day/month/year)</u>

**WRITTEN OPINION OF THE  
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International application No.

PCT/KR2005/001120

**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. It is disclosed that Korea Patent No. 1996-7002860 of [6] in the background art relates to a manufacturing method of zeolite catalyst, but such a document cannot be found.